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METHOD FOR CONVERTING OIL TANKERS
[Abura Tanka No Kaizo Hoho]

Masaaki Adachi, et al.

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INVENTORS	(72):	ADACHI, MASAAKI; AZUMA, KIYOSHI; SUMIDA, MAKOTO; MOMOMI, KENJI
APPLICANT	(71):	HITACHI ZOSEN CORPORATION
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SPECIFICATION

1. Title

METHOD FOR CONVERTING OIL TANKERS

2. Claims

A method for converting oil tankers comprising a step of cutting the deck member above each central tank of an oil tanker of the longitudinal double-row bulkhead type, a step of bringing this deck member down to the lower part of the inside of the central tank so as to form a double-bottom structure using this deck member as the inner bottom plating, a step of providing new longitudinal walls at the upper edges of the facing longitudinal bulkheads as their continuous extensions in such a manner that the new longitudinal walls protrude above the deck and of attaching new transverse walls between both ends of these new longitudinal walls, and a step of forming a new deck at the upper edges of the aforesaid new longitudinal walls and new transverse walls and providing a hatch that protrudes above this new deck.

3. Detailed Description of the Invention

The present invention pertains to a method for converting oil tankers into cargo ships for carrying general cargos, including ores, grains, and other bulk cargos or into combination-use carriers for these cargos and oil.

In view of the current situation that there are more oil tankers than necessary as the result of decline in the shipborne oil volume

since the so-called oil crisis, the object of the present invention is to provide an efficient method for converting this type of tanker into the aforesaid type of cargo ship or combined carrier.

The following explains the present invention in detail, referring to drawings.

Figs. 1 and 2 illustrate an oil tanker of the longitudinal double-row bulkhead type. This tanker (1) has an engine room (2) at the stern. The oil tank is segmentalized into a large number of central tanks (5) and side tanks (6) by longitudinal bulkheads (3) that face each other and by transverse bulkheads (4) provided at established intervals.

The aforesaid tanker (1) is converted into the cargo ship (combination-use ship) (21) shown in Figs. 8 [sic] and 4 in the following manner. That is, the deck member (7a) located above each central tank (5) that is surrounded by the longitudinal bulkheads (3) and transverse bulkheads (4) is cut in a rectangular shape, thereby forming an opening here, and this deck member (7a) is brought down to the inside of the central tank (5) so as to use it as the inner bottom plating (22) and form a double-bottom structure together with the bottom plank (8). New vertical longitudinal walls (23) are provided at the upper edges of the longitudinal bulkheads as their continuous extensions in such a manner that the new vertical longitudinal walls protrude above the upper deck (7), and new transverse walls (24) are also attached between both ends of these new longitudinal walls (23),

thereby surrounding the area above the aforesaid opening. Thereafter, a new deck (25) is formed horizontally at the upper edges of the new longitudinal walls (23) and new transverse walls (24), and a hatch that protrudes above this new deck (25) is further provided. In this manner, a hold (27) for general cargo use is formed.

When cutting the deck member (7a) in the foregoing, the cuts in the vertical direction are made along the upper edges of the longitudinal bulkheads (3), but, with respect to the cutting in the transverse direction, it is preferable to cut sections that are located slightly inward from the transverse bulkheads (4). Consequently, the length of the new longitudinal walls (23) is slightly shorter than the interval of the transverse bulkheads (4). The side borders and end borders of the opening that is formed by the aforesaid cutting are sufficiently reinforced with the new longitudinal walls (23) and new transverse walls (24), but, if necessary, side beams, etc., can be provided for them. The new longitudinal walls (23) and new transverse walls (24) are reinforced with support plates (stays, brackets, etc.) (28), horizontal braces, etc. These reinforcing materials are positioned on the exterior side of each wall (23, 24). On the underside of the new deck (25) are also laid frames, such as deck stringers, side beams, etc. The hatch (26) may have the same structure as that of a conventional type. A coaming is provided at the borders of the hatch, and a hatch lid is placed on

the upper edge of this coaming. Incidentally, the upper deck (7) excluding the deck-member (7a) portion is left as-is.

To convert the bottom of the hold into a double structure by bringing the deck member (7a) down to the lower part of the inside of the central tank (5), the underdeck girder (9), deck stringers (10), and side beams (11) located on the underside of the deck member (7a) and the center girder (12), side members (13), and cross members (14) at the ship bottom are utilized. More specifically, according to the height of the inner bottom plating (22), the aforesaid side and cross members on the underside of the deck member (7a) are cut to an appropriate height and welded to the aforesaid side and cross members on the bottom plank (8), thereby forming a center girder (29), side girders (30), floor plates (31), and, as necessary, ship-bottom side members. The height of the inner bottom plating (22) should be determined appropriately according to the cargo to be carried in the hold (27), and, to form an ore hold, for example, the height of the inner bottom plating is set higher than the height for general cargos. In addition, bottom slopes (22a) may be formed at the bottom of the hold on both sides, as necessary. These slopes (22a) can also be formed by utilizing the sloped sides (14a) at both sides of the ship-bottom cross members (14) or brackets, etc., that are mounted on these areas.

The side tanks (6) will be left alone. Generally speaking, in an oil tanker (1) of the longitudinal double-row bulkhead type, all the

frames, such as horizontal braces, (15), hull cross members (16), longitudinal bulkhead stiffeners (17), other frames, etc., are located inside the side tanks (6), and there is no frame on the central tank side of the longitudinal bulkheads (3); therefore, on the interior side of the newly formed hold (27), there is no frame at all that could lie in the way of a cargo loading operation.

In the aforesaid case, all of the central tanks (5) are converted, but it is possible to convert only a required number of contiguous tanks or of tanks that are separated by a few other tanks. If there are oil-control partitions, they may be removed or left alone.

With the cargo ship (21) thus obtained, inside the holds (27) that are newly formed by converting the central tanks are loaded bulk cargos, such as ores, grains, etc., or other general cargos, while oil is loaded in the central tanks (5) that are left without the conversion. The side tanks (6) are used as oil tanks, ballast tanks, or freshwater tanks.

As explained in the foregoing, according to the present invention, the deck member above each central tank of an oil tanker of the longitudinal double-row bulkhead type is cut, and this deck member is brought down to the lower part of the inside of the central tank so as to form a double-bottom structure using this deck member as the inner bottom plate; therefore, the present invention can achieve substantial reduction of the steel product that is required to construct the inner bottom plating, thus rendering itself highly economical. In addition,

the present invention provides new longitudinal walls as continuous extensions of the facing longitudinal bulkheads in such a manner that the new longitudinal walls protrude above the deck and attaches new transverse walls between both ends of these new longitudinal walls, thereby surrounding the area above the opening formed by the aforesaid cutting; consequently, the newly formed hold protrudes above the deck and, thus, is built higher. Accordingly, the hold can carry more cargos, thus having improved volumetric efficiency. In addition, since cargos can be loaded higher to the top, the center of gravity is shifted to the upper portion of the hull, thereby preventing the pitching/rolling cycle of the hull in navigation from becoming shorter. Since the newly formed hold is converted from a central tank, its width is narrower than the ship width as much as the width of the side tanks. Therefore, the shifting of cargo (especially bulk cargo) caused by the pitching/rolling of the hull can be reduced. More specifically, bulk cargo carriers generally have shoulder tanks (top side tanks) provided on both sides of the cargo hold at the upper section and use these tanks as the ballast tanks, and, with this configuration plus the sloped walls that compose these tanks, the shifting of cargo is prevented. On the other hand, since the converted hold of the present invention can reduce the shifting of cargo without requiring shoulder tanks, and the side tanks can be used as ballast tanks, it is very convenient. In addition, the new longitudinal walls serve to strengthen the hull in the longitudinal direction. Moreover, all

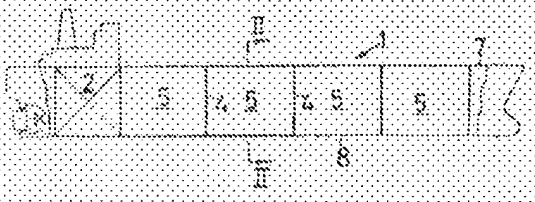
frames are located inside the side tanks, and the converted hold has no frames at all that could lie in the way of a cargo loading operation, thereby facilitating cargo loading. Because a new deck is formed at the upper edges of the new longitudinal walls and transverse walls and a hatch is further provided, the hold is waterproofed, and cargo loading can also be performed very smoothly.

4. Brief Explanation of the Drawings

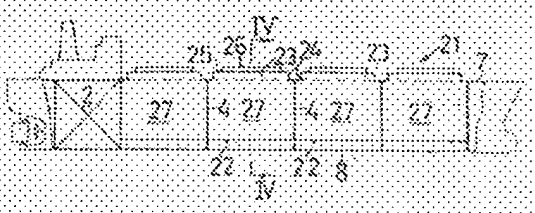
Figs. 1 and 2 illustrate an oil tanker before the conversion, Fig. 1 being a schematic drawing of a vertical cross-section and Fig. 2 being a detailed and enlarged drawing of the cross-section at line II-II in Fig. 1. Figs. 3 and 4 illustrate a cargo ship after the conversion, Fig. 3 being a schematic drawing of a vertical cross-section and Fig. 4 being a detailed and enlarged drawing of the cross-section at line IV-IV in Fig. 3.

(1) oil tanker of the longitudinal double-row bulkhead type, (3) longitudinal bulkhead, (5) central tank, (7) upper deck, (7a) deck member, (21) converted cargo carrier, (22) inner bottom plating, (23) new longitudinal wall, (24) new transverse wall, (25) new deck, (26) hatch, (27) cargo hold formed by the conversion.

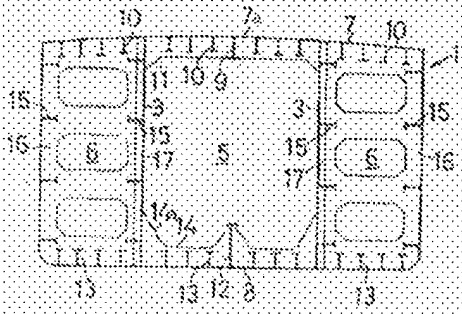
[FIG. 1]



[FIG. 3]



[FIG. 2]



[FIG. 4]